



# NEVADA'S COORDINATED INVASIVE WEED STRATEGY

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## FOREWORD

The Nevada State Weed Plan was developed by the Nevada Weed Action Committee as the result of a collaborative process driven by the need to more effectively implement control of invasive weeds throughout the state. The Nevada Weed Action Committee is an interagency working group formed by the Nevada Department of Agriculture. The mission of this committee is to coordinate and facilitate local, county, state and federal agency programs and projects for the control and management of noxious and invasive weeds in Nevada.

Nevada is not yet severely infested with many of the species that are troublesome in neighboring states. Through this plan we can effectively coordinate weed control efforts, both public and private, and thereby take advantage of this opportunity to preserve or reclaim Nevada's ecosystems.

The following individuals, groups, and agencies contributed to this plan:

County Commissioners	Private Industry
Irrigation Districts	Pyramid Lake Paiute Tribe
Naval Air Station Fallon	Ranchers and citizens
Nevada Department of Agriculture	University of Nevada Cooperative
Nevada Department of Conservation	Extension
and Natural Resources	USDA Agricultural Research Service
Nevada Department of Transportation	USDA Farm Services Agency
Nevada Division of Conservation Districts	USDA Natural Resources
Nevada Division of Forestry	Conservation Service
Nevada Division of Minerals	USDA Forest Service
Nevada Division of State Parks	USDI Bureau of Indian Affairs
Nevada Division of Wildlife	USDI Bureau of Land Management
Nevada Farm Bureau	USDI Bureau of Reclamation
Nevada Natural Heritage Program	USDI Fish and Wildlife Service
Nevada State Assemblymen and Senators	USDI National Park Service
Nevada Weed Management Association	Washoe Tribe
	Weed District Personnel

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# **I. STATUS OF INVASIVE WEEDS IN NEVADA**

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## **A. INTRODUCTION**

Invasive plants are increasingly infesting the over 890 million acres of land which comprise the western states of North America. Many non-native plants are introduced to our state each year and are usually benign. Particular species, however, are considered invasive because of their ability to rapidly reproduce and spread, ultimately out-competing all other vegetation in an area to form dense stands composed solely of this one unwanted species.

These weeds often arrive here unintentionally, carried by natural elements or as contaminants in seed grain, packaging material, bilge or ballast waters, or attached to a vehicle's body or tires. Some have been unwittingly introduced for their perceived value, colorful flowers or ability to endure harsh growing conditions.

These invasive species damage native vegetation, displacing native plants on millions of acres. They crowd out plants that have held footholds here for thousands of years and restrict or interfere with land management objectives. Once a plant is classified as an invasive weed, it can attain a *noxious*, or harmful, status only through legislation. An invasive weed is usually declared noxious once its effect upon the environment is understood. More than 500 weeds in the United States and Canada are classified as noxious, presenting an enormous challenge to the landowners impacted by their arrival.

Invasive weeds are typically not native to North America. Most originated in Europe or Asia and were transported to North America. In their native ecosystems, these species are held in check by competing plants, plant pathogens, and insect predators. When these invasive weeds arrive in Nevada, they spread unchecked, as there are no naturally occurring enemies to control them. We are at great risk of experiencing tremendous growth in their populations due to their fast growth characteristics, environmental adaptability, and high reproductive rates.

According to the United States Department of Agriculture, *noxious weeds* are defined as "species of plants that cause disease or are injurious to crops, livestock or land, and thus are detrimental to agriculture, commerce or public health." In an agricultural setting, invasive weeds interfere with crop production or other uses of the land. In natural or wildland areas, these species cause a drastic change in the composition, structure, and function of ecosystems. The encroachment of noxious weeds is reducing the resource values of agricultural, rangeland, forests, critical watersheds, wetlands, and wildlife habitats, while increasing the economic

burden of protection, control, and restoration. Noxious and invasive weeds are problematic in urban environments for the same reasons.

Invasive weeds often share the following characteristics:

- *Are highly competitive* – They compete very effectively with cultivated and native plant species for sunlight, water, nutrients, and space. They are highly adaptable and have few natural competitors.
- *Are exotic* – Most are non-native, introduced species.
- *Are highly aggressive* – They are able to displace native species, even in undisturbed sites, because they can flourish in a wide variety of habitats. They often alter the habitats they invade.
- *Cause economic losses* – These weeds have little or no economic value as forage or wildlife habitat. Some are toxic or physically damaging to animals.
- *Cause environmental degradation* – Among other negative impacts, these weeds reduce or eliminate biodiversity, increase soil erosion, and reduce water quality and quantity. Once established, invasive weeds have the potential to increase the occurrence, size, and intensity of wildfires.
- *Are easily spread* – Most spread by seed and vegetative reproduction, meaning they can grow from pieces of stem and roots. Many are moved into uninfested areas by unsuspecting people who think their flowers are beautiful. Others are carried as seed or plant parts by animals, vehicles, equipment, and clothing to new locations.
- *Once established, are difficult, if not impossible, to control* – Their management is very expensive in time, money, and human resources; once established they can be nearly impossible to eradicate.
- *Can augment wildfires* – Once established, many have increased the occurrence, size, frequency, and intensity of wildfires.

## **B. WEEDS AND LANDSCAPE ALTERATION**

In nature, extensive acres of a single plant type or species rarely occur, except in agricultural or intentional plantings. The diverse complex of plant communities provides for the necessary forage, cover, and other needs of a variety of insects, birds, small and larger mammals and other wildlife, as well as for livestock. No one species is able to use all of the land available, but there is sufficient diversity for multiple species to coexist. Whenever we upset that mosaic of plant communities (for whatever reason), resulting in decreasing biodiversity, problems occur.

Once an area is disturbed, vegetation can reestablish following any number of scenarios depending upon factors such as local seed availability, moisture, or other influences. In addition, catastrophic occurrences can dramatically affect the plant community of a particular site. An example is the domination by invasive weeds. In this case, the local plant community is disrupted and the invasive weed becomes the dominant species for that particular site. Most importantly, when invasive weeds dominate an ecosystem, the ecosystem is impacted by cascading,

degrading changes, all of which may be nearly impossible to reverse both in respects of cost and time required for reversal.

The first widespread weed in Nevada considered "invasive" was Russian thistle (*Salsola iberica*) or tumbleweed. After introduction in the late 1800s, it spread rapidly across the West. *Halogeton glomeratus* was the second introduced species that became recognized as "invasive." First discovered just south of Wells, Nevada in 1934, by 1952 it occupied approximately 1.5 million acres in seven states.

Neither of these species are of extreme concern today because they are not capable of displacing most of the plants occupying the land to form a monoculture. In fact, the best control for both Russian thistle and halogeton is reclamation of the occupied site so there is sufficient competition to crowd them out completely. In other words, they are present because of continued disturbance rather than an ability to out-compete all other vegetation types, as characterizes invasive and noxious plant species.

Other introduced species do invade and drastically change the natural resource environment. Cheatgrass (*Bromus tectorum*) invasion of dry rangeland shrub-steppe habitats of the Great Basin is a well known, but far from exclusive example. There were no significant annual grasses in the Great Basin until cheatgrass was introduced in the early 1900s. Cheatgrass is a European annual grass that is fine stemmed, so it carries fire easily and it is fire adaptive. This allows it to re-establish rapidly after a fire as a monoculture, or solid stand of a single plant species, on the burned land. Cheatgrass monoculture acreage has increased substantially in Northern Nevada, Eastern Oregon, and the Snake River Plain of Idaho since the large fires of 1964. Competitive monocultures of cheatgrass now exist on 12.5 million acres in Idaho and Utah and approximately nine million acres in Nevada. Before the invasion of cheatgrass, fire burned once every 60-110 years in the Great Basin, and shrubs had a chance to become well established. Today, regular fires that occur every 3-5 years ensure that cheatgrass remains the dominant species. Wildlife that depends upon a diverse plant community no longer inhabits cheatgrass infested lands.

The establishment of cheatgrass monocultures is a problem in itself, but it represents an even greater threat because cheatgrass dominated areas are readily invaded by fire tolerant, invasive perennials such as the knapweeds (spotted, diffuse, squarrose), rush skeletonweed, or yellow starthistle. These species are tolerant of fire because there is insufficient heat during range fires to destroy viable seed or vegetative reproductive parts at or below the soil surface. They are then able to establish without competition. These plant species then form monocultures that will be permanent, for all practical purposes, throughout Nevada.

There are a number of other weeds that many in Nevada consider invasive but are actually only persistent pests. These species cannot maintain extensive monocultures without continued disturbances by man, and therefore are not

considered to be as threatening to the natural environment. Sometimes we allocate limited resources to control plants not because of environmental concerns, but due to local political considerations. A small sampling of such species includes plants such as curly dock (*Rumex crispus*), Russian thistle (*Salsola iberica*), common burdock (*Arctium minus*), and field dodder (*Cuscuta campestris*). A methodology needs to be developed which is able to accurately predict species that will dominate native vegetation prior to the establishment of monocultures. Today in Nevada, we can only deduce the potential problem from comparison with neighboring states and from initial invasions in the state and their rapid spread.

## **C. ECONOMIC IMPACTS**

A recent survey by the U.S. Department of the Interior found that noxious weeds have invaded 17 million acres of public rangelands in the West. Invading alien species in the United States cause major environmental damages and losses totaling more than \$138 billion per year. The cost of invasive weed control alone is shared by everyone, from homeowners (\$500 million/year) to golf courses (\$1 billion/year), to ranchers (\$5 billion/year), and farmers (\$3 billion/year).

A lack of local quantitative biological, ecological, economical and sociological data about the many invasive species in existence makes it difficult to estimate costs beyond impacts on agriculture, forestry, and public health. However, we can use examples from other states to predict the potential economic threat to Nevada from invasive species.

Rangelands throughout the West have fallen victim to a number of invasive species that alter natural communities and result in economic damages. Leafy spurge (*Euphorbia esula* L.) has spread to over 1 million acres in North Dakota and has also spread rapidly across Montana and into Wyoming, Idaho, Washington, and Utah. Today, leafy spurge dominates more than 2.5 million acres in 30 states. The economic impact of leafy spurge in Montana, North Dakota, South Dakota, and Wyoming has been estimated at \$129.5 million per year, with a potential loss of 1,433 jobs. Leafy spurge is present in Eastern Nevada today, and has the potential to spread statewide.

One of our best examples of impacts to the economy comes from estimates from Montana. Spotted knapweed (*Centaurea maculosa*) has invaded over 4.5 million acres in Montana, and another 46.5 million acres are threatened. Spotted knapweed is estimated to cost the state \$42 million annually. This estimate includes impacts to grazing lands totaling \$36 million as a result of personal income losses, lost cash outlays due to reduced livestock, and associated economic impacts. An additional \$6 million per year in losses can be attributed to reduced wildlife-associated recreation, increased soil erosion, and increased conservation needs, which require mitigation of degraded and reduced water supplies. Other impacts include losses in the value of land due to weed infestation and loss of carrying capacity for livestock and wildlife. Montana estimates that yearly costs to the agricultural industry will exceed \$155 million per year if spotted knapweed is



allowed to expand to the fullest extent of its range. Nevada is in the early stages of infestation by spotted knapweed.

In California alone, yellow starthistle (*Centaurea solstitialis*) has spread from one million acres infested in 1977 to over 22 million acres, or 22% of the state, today (California Agriculture, 1999). This invasive weed has taken over and destroyed the value of formerly productive grasslands, and has not stopped at California's border, but has also invaded extensive acreages in Idaho and Washington and is currently invading Nevada.

Weeds that infest waterways and wetlands have major impacts on water quality, habitat, recreation, and stream function. European purple loosestrife (*Lythrum salicaria*) has been spreading at a rate of 280,000 acres per year, and is changing the basic structure of the wetlands it invades (Pimentel et. al., 1999). Wetlands infested with purple loosestrife commonly lose 50 –100% of the native plant biomass, resulting in changes in food and cover for wildlife. Loosestrife is currently present in 48 states and costs \$45 million per year in control costs and forage losses. This riparian invasive weed is now found in the Truckee and Carson River drainages.

#### **D. NEVADA WEED LEGISLATION**

Most states have laws that identify certain weeds as "noxious". Nevada is no exception. Chapter 555.005 of the Nevada Revised Statutes (NRS) defines a noxious weed as "any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate." A list of currently designated noxious weeds can be found in the Nevada Administrative Code (NAC), Chapter 555. A copy of this species designation that was in effect at the time of this report can be found in Appendix A.

The Nevada Legislature has declared that it is the obligation and responsibility of the owners or occupiers of land in Nevada to control all weeds designated as noxious by the Nevada Department of Agriculture. This applies to private landowners, cities, counties, ditch companies, railroads, federal and state agencies, etc. If the owner or occupier of land fails or neglects to control noxious weeds, enforcement action can be taken by the Nevada Department of Agriculture.

The Department of Agriculture can contact the owner or occupier and advise them of the actions they must take to address their noxious weed problem. If the owner-occupier fails to take action, the Department of Agriculture is authorized to notify the county commissioners of the county in which the land is located. The county commissioners shall then perform the control actions required, paying for them out of county funds. The county can then bill the owner or occupier for the cost of performing the work.

In turn, the owner-occupier can file an objection with the county. If the county commissioners determine that some or all costs are to be borne by the owner-

occupier, they can, as a last resort, collect the money through a tax lien on the land. This mechanism is rarely used. When advised of the problems caused by noxious weeds, most landowners-occupiers readily comply.

The Nevada Legislature recognizes that noxious weeds can, at times, be difficult to control. Provisions have been made in the law for the development of cooperative efforts by local landowners and/or public agencies via weed control districts or general improvement districts.

## **E. SPECIES OF CONCERN**

As mentioned previously, the list of Nevada's designated noxious weeds can be found in Appendix A. However, not all invasive weeds threatening to enter Nevada are found on this list. Based on the experience of surrounding states and existing scientific literature, the following species are those that currently have the potential to cause the greatest impact on Nevada's ecosystem and economic well being.

Upland plant communities:

- red brome (*Bromus rubens*)
- cheatgrass (*Bromus tectorum*)
- hoary cress or low whitetop (*Cardaria* sp.)
- musk thistle (*Carduus nutans*)
- diffuse knapweed (*Centaurea diffusa*)
- spotted knapweed (*Centaurea maculosa*)
- Russian knapweed (*Centaurea repens* L.)
- yellow starthistle (*Centaurea solstitialis* L.)
- squarrose knapweed (*Centaurea virgata* spp. *Squarrosa*)
- rush skeletonweed (*Chondrilla juncea* L.)
- common crupina (*Crupina vulgaris*)
- leafy spurge (*Euphorbia esula* L.)
- Dyer's woad (*Isatis tinctoria*)
- Dalmation toadflax (*Linaria dalmatica*)
- yellow toadflax (*Linaria vulgaris*)
- Scotch thistle (*Onopordum acanthium*)
- sulfur cinqufoil (*Potentilla recta* L.)
- medusahead (*Taeniatherum caput-medusae*)

Riparian areas:

- tall whitetop or perennial pepperweed (*Lepidium latifolium*)
- purple loosestrife (*Lythrum salicaria* L.)
- saltcedar (*Tamarix* spp.)

Waterways are threatened by:

- Eurasian or spiked watermilfoil (*Myriophyllum spicatum*)

- giant salvinia (*Salvinia molesta*).

## **F. GAPS IN WEED MANAGEMENT**

The Nevada Weed Action Committee used results from a survey of land managers and from a brainstorming process to identify the following general issues that represent gaps in the current approach to weed management in Nevada. Identification of these gaps led to the development of the next section of the weed plan, the strategic plan.

- Lack of funding and personnel for weed management efforts
- Non-existent long-term database on invasive weeds in Nevada
- Lack of organized early detection and treatment systems
- A need to coordinate local plans with agency weed priorities
- Failure to place adequate priority on weed control efforts and funding
- Lack of enforcement of weed control responsibilities
- A one-dimensional view of weed control (i.e., kill the weed) that needs to be broadened into an understanding of landscape-scale ecology and a sense of stewardship for the land
- Insufficient outreach and education
- No centralized source of information on weed management
- A need for further research into more effective control methods and post-treatment site stabilization (i.e., revegetation)

Effective weed management and control in Nevada is complex because of the various agencies that are involved. Nearly 87 percent of the state is administered by the federal government, and there are a number of agencies that have an important role to play in a statewide weed program.

## **II. STRATEGIC PLAN**

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### **A. STRATEGIC PLAN OVERVIEW**

The intended purpose of this plan is to facilitate and coordinate local, county, state and federal agency programs and projects to achieve effective control and management of noxious and invasive species on a statewide basis. To achieve this objective, this plan adopts the following focuses:

1. Implementation of an aggressive outreach program to inform landowners of their legal responsibilities to control designated noxious weeds on their property and to educate the general public as to the role of land stewardship in effective weed management;
2. Development of programs and mechanisms to assist local districts and agencies to maximize their capabilities to detect, control, eradicate or manage weed populations;
3. Establishment of organizational structure and processes to coordinate and guide local weed control activities in a manner to effectively achieve and address statewide weed management issues and priorities; and,
4. Implementation of Coordinated Weed Management Areas, or focused interagency working groups, to deal with specific weed issues that are currently not addressed by existing weed control programs.

Due to the need to pool agency resources and implement this plan in a coordinated manner, the Nevada Weed Action Committee will continue to function as the interagency weed coordination body for purposes of effectively implementing this weed plan, prioritizing statewide weed issues, and developing cooperative efforts and programs to address priority weed issues.

Based on this proposed organization, the following plan outlines the critical components of weed management in Nevada and presents a 5-year action plan to initially implement this State Weed Plan.

### **B. WEED MANAGEMENT PRIORITIES**

Resources for weed management, money, time, people, knowledge, etc., are often limited. Prioritizing weeds and tasks helps land managers decide where to focus their immediate and long-term attention. Important weed management tasks include prevention, eradication, containment, and monitoring.

The first weed killing priorities are those invasive species that can be eradicated or controlled. The biggest return on an investment in weed management comes from killing the first invasive weed of its kind in an area. Killing the weeds in small

young patches is relatively easy. However, as a patch establishes deeper roots, produces more seed and displaces competing vegetation, the difficulty of control increases and revegetation becomes more difficult. Furthermore, once the weed or patch starts producing seed, the risk to surrounding land increases.

The following six priorities have been identified by the Nevada Weed Action Committee to allow land managers to move from an atmosphere of crisis into a proactive, effective weed management process that makes the best possible use of our limited resources.

1. **Foster a sense of stewardship of the land** of Nevada in order to minimize the disturbance of open spaces where invasive weeds have an opportunity to colonize, and reduce the unintentional spread and introduction of weed species.
2. **Develop an invasive weed plan** for every land unit based on the above principles
3. **Educate the public and land managers** about the damage and expense resulting from invasive weeds. Inform the public about ways in which people contribute to weed invasion by spreading seed and plant parts and creating disturbed areas for colonization.
4. **Establish cooperative efforts** throughout the state. These can take place as legal weed districts, cooperative weed management areas, or simply as a group of interested individuals willing to take on a challenge in order to protect their lifestyle and the environment.
5. **Prevent the introduction** of invasive species that are not currently present in Nevada. When a species has been introduced but has a very limited area of colonization, concentrate efforts to prevent its spread to new areas.
6. **Fund adequate research** to address the invasive weed problem in Nevada.

## **1. LAND STEWARDSHIP & ETHICS**

Stewardship of the land is not a new concept, just one that is associated with many different labels, depending upon the group that is presenting the concept. The concept of stewardship is basically "caring for" and/or protecting the land and environment or habitat within a designated boundary. In this case, the land and environment/habitats of concern lie within the state boundaries of Nevada.

The responsibility of conducting stewardship rests with every citizen of the state, whether that citizen resides in a large city or a rural setting. With

respect to the prevention of invasive weeds, the concept can be applied equally to both private and public properties.

Though the negative economic impact of invasive weeds is most apparent to the agricultural sector, the costs related to their control are reflected in numerous other venues. The cost of city office or warehouse rental space will have hidden landscape maintenance fees that are proportionally related to the amount of labor and any chemical applications required during the year for weed control. Public golf course "greens fees" have hidden costs that are related to weed control and the application of herbicides to control weeds. When homeowners decide to fertilize their lawns that may decide to use a "weed and feed" fertilizer to control weeds, which is more costly than regular fertilizer.

Being good stewards of the land, irrespective of land use or lot size, results in long-term benefit to each of us individually and collectively as a society. Only when this concept is fully understood and implemented by the public can effective actions occur to reduce the problem of invasive weeds and their associated negative aesthetic, environmental or economic impacts. The ethics of good citizenship and good stewardship go hand in hand.

The Nevada Weed Action Committee recommends the following approaches toward increasing a sense of land stewardship:

1. A coordinated education and awareness program that teaches the ways in which weed invasion changes ecology and plant/animal community dynamics in the invaded areas, both rangeland and riparian. This educational program would also teach the provisions of the noxious weed law that relate to landowner responsibility in controlling weeds.
2. Advertise and expand the capabilities of the existing state seedbank for the purpose of providing a dependable and affordable source of plant seed for important native and conservation species for state agencies and private land owners. The seedbank should be funded sufficiently to allow the purchase of seed at reasonable prices during high demand periods, and staffed and supplied with necessary equipment. The stable, reasonably priced seed source provided by this expanded program would serve as an incentive to private landowners and state agencies to establish stable, productive plant communities after weed treatment or fire events. The seed bank could also be accessed by state agencies to diversify public land seeding in critical areas. After expiration, seed from this program could be donated to public agencies and other entities to seed public right-of-ways when appropriate to protect against weed invasion and reduce fire hazards.
3. Include the Nevada Weed Action Committee's participation in state resource policies and planning to provide perspective and input on land stewardship issues.

4. Match need with availability of equipment and government expertise to help private landowners address invasive weed problems. This might include low interest loans, emergency funds, or National Resources Conservation Service farm plans and technical assistance.
5. Work cooperatively with contractors, developers, realtors, homeowner's associations, builder's associations, and land managers to provide education regarding site assessment and other procedures that can be voluntarily implemented to stop the spread of weeds.

## **2. WEED MANAGEMENT**

At the center of any invasive weed plan is an effective weed management strategy based on appropriate prioritization of infested sites. In order for any weed management effort to be successful, there must be a coordinated approach that involves stakeholders from governmental agencies to private landowners and the community. Coordination is not enough, however; there must also be a clear understanding of the magnitude of the existing weed problem as well as the appropriate weed management tools to apply in each situation.

Integrated Pest Management techniques are recommended or mandated for use by numerous agencies when implementing a weed control program. These techniques allow the application of appropriate tools, including prevention, eradication, mechanical, cultural, biological, and chemical controls, in the successful containment and control of infestations. A large gap in knowledge currently exists among weed control practitioners concerning the application of Integrated Pest Management principles and methods.

A related issue is resistance to the application of appropriate control techniques. A segment of the general population, including professionals in the natural resources field, fear environmental damage from herbicides, biological control agents, and genetic manipulation techniques associated with necessary weed control practices. This fear results in various activities aimed at halting essential invasive weed control actions or requiring actions that are ineffective in controlling the target weed.

The Nevada Weed Action Committee proposes the following steps to strengthen weed management efforts statewide:

1. Conduct surveys of land management agencies and appropriate parties in the private sector to compile information on the type of treatment and post-treatment revegetation projects that have been implemented, their effectiveness and economic, social, and environmental impacts.

2. Facilitate the establishment of local weed districts by providing expertise and funds for start-up, and assist districts in establishing a weed plan or action to be taken to control identified invasive weeds.
3. Implement comprehensive Integrated Pest Management and Best Management Practices (BMPs) training programs for all agencies and individuals who are involved in an organized weed control program in Nevada. Provide periodic refresher courses as needed to keep weed control practitioners current on recommended Integrated Pest Management techniques and BMPs. Develop training materials using a multidisciplinary team from all appropriate agencies. The team will cooperatively develop a set of Integrated Pest Management practices for adoption by all weed control practitioners in Nevada.
4. Ensure that Integrated Pest Management techniques are implemented statewide. Publicize the fact that using this system ensures the least toxic invasive weed control practices possible are implemented in Nevada's weed control program.
5. Assist counties and districts in the dissemination of information on existing noxious weed statutes by including information with regular mailings such as property tax bills.
6. Encourage the adoption and implementation of practices such as sanitation and quarantines that prevent the establishment of invasive weeds.
7. Enforce existing regulations and provide education on the proper use of pesticides. The pesticide applicator safety training program should be publicized regularly with a goal of demonstrating how seriously the weed control industry takes its environmental stewardship responsibility.
8. Gain public support for effective invasive weed control practices that include use of herbicides and other techniques supported by sound science.
9. Expand the role of the Nevada seed bank to include restoration following major weed control projects.
10. Create a directory for equipment for weed control
11. Create a source book for grant programming

### **3. EDUCATION AND AWARENESS**

The rapid spread of invasive weeds in Nevada is directly related to the general public's lack of knowledge and awareness of both economic and ecological threats posed by invasive weeds. Although more citizens are aware of these



threats today than five years ago, the need is greater than ever to establish proactive education and awareness enhancement programs. Both traditional and multimedia techniques should be employed to effectively reach the broadest possible audience.

In response to this need, the Nevada Weed Action Committee recommends a dynamic and innovative statewide education and awareness initiative incorporating the following approaches:

1. Provide adequate fiscal support for University of Nevada Cooperative Extension, in conjunction with the Nevada Weed Management Association, to develop and implement a statewide youth and adult invasive weed educational program. The statewide school curriculum (grades K-12) would include a training program for teachers at all grade levels through a continuing education credit program. Implement the curriculum in all schools throughout the state.
2. Incorporate weed education into existing educational programs, such as "Ag in the Classroom" and Master Gardeners and expand existing natural resource education programs to include units on invasive weed management.
3. Develop a comprehensive listing of available educational resources and materials, including a speaker's bureau of qualified individuals available for speaking engagements at various events.
4. Develop and maintain a web site that includes the following:
  - Information on Nevada noxious weed legislation
  - A list of Nevada noxious weed species
  - Descriptive information about these species
  - Images of each species
  - Treatment information
  - Distribution maps
  - A directory to agencies charged with weed controls
  - An annual monitoring and treatment report
  - A list of certified weed-free product suppliers
  - Links to other weed control sites
5. Continue to create and fund educational materials, "wanted" posters, and other similar types of displays to educate and enhance awareness. Provide these materials to communities and cooperative weed management groups to assist in their educational efforts.
6. Participate in an established regional clearinghouse on invasive weed management and broadly publish the usefulness and availability of the resource.

#### **4. COORDINATION, COOPERATION, & PARTNERSHIPS**

In many parts of Nevada, weed problems arise due to a lack of organized planning, support, and funding on the local level. Often the magnitude of the problem appears overwhelming, resulting in a lack of prioritization by local government.

However, there are a number of approaches to coordinated weed management, including Coordinated Weed Management Areas, weed districts, informal groups, Conservation Districts, General Improvement Districts, irrigation districts, individuals, and agencies. The most important factor in success lies not in the specific approach adopted, but instead on the commitment made by the partners.

To be effective, coordinated weed management efforts must involve all stakeholders, including private, local, state, tribal, and federal organizations, as well as the general public participating in a consistent weed management plan within a watershed or geographic area. Partnerships among local, state, regional and national groups including conservationists, fishermen, hunters, realtors, recreationists and other interests should be formed to broaden and strengthen cooperative weed management efforts.

By working cooperatively, local organizations can partner with natural resource agencies, educational institutions and other agencies to provide resources and sources of funding.

The Nevada Weed Action Committee proposes the following approaches to increase coordination, cooperation and partnership:

1. Work with the Nevada Department of Agriculture Weed Specialist to develop a resource directory that lists individuals from local, state and federal government agencies, universities, agricultural organizations, task force groups, weed management associations, and conservation organizations with particular weed management expertise and skills. The directory would be made available to anyone interested in establishing a Coordinated Weed Management Area to provide up-to-date weed information and sources of assistance and would be placed on the state weed web page.
2. Facilitate communication among local weed management groups and agencies by holding regular meetings and providing current weed control information.
3. Develop a link to established national website for grant and funding sources for weed control projects consider the development of an incentives-based grant program.

4. Develop and maintain a list of all weed control projects and contacts and potential partners for purposes of coordinating and leveraging funds.
5. Assist in the development of agency Memorandums of Understanding to implement the State Weed Plan and various management projects.

## **5. PREVENTION OF NEW INFESTATIONS**

The early detection and eradication of newly arrived invasive weed populations in Nevada is a top priority of the state weed control program. Due to the sheer size of the State of Nevada, it is difficult to adequately inventory and map invasive weed species, despite the immediate need for this information. Prevention is the most cost-effective strategy in managing invasive species, but requires a number of actions, beginning with an assessment of the distribution, extent, and trends of invasive weed spread in Nevada and all neighboring states. Currently, data is lacking to allow us to understand how individual species spread over time. The existing data is often neither available nor usable at a local level where planning decisions are made.

In addition to a need for weed mapping, methods of border protection are essential. There are a number of invasive weed species such as rush skeletonweed that are present in neighboring states but have not yet been reported in Nevada. Many of these species are difficult or impossible to control once established.

The Nevada Weed Action Committee recommends the following approaches to prevent new infestations:

1. Work with the University of Nevada Cooperative Extension, the Department of Agriculture, the Department of Conservation and Natural Resources, the National Resources Conservation Service, the Bureau of Land Management, and the Forest Service to produce a statewide noxious weed map. The map, in GIS format, will show existing weed species and densities by location, the boundaries of land managing agencies charged with weed management and areas that are covered by cooperative agreements, weed district boundaries, conservation district boundaries, and coordinated weed management areas. After the map has been developed, mapping accuracy should be tested to determine gaps in data collection.
2. Develop protocols and training and allocate agency personnel to regularly monitor and update the statewide weed map/GIS to provide real time information on weed expansions.
3. Work with the Natural Resources Conservation Service using the ecological site classification method to develop a statewide noxious weed hazard map

for the purpose of highlighting areas susceptible to weed invasion and requiring increased early detection monitoring.

4. Develop a technical manual describing how to implement, monitor, and evaluate various early treatment techniques, as well as recommended treatments by species. This technical manual will be available on the web site.
5. Communicate regularly with surrounding states to identify newly discovered or expanding invasive weed populations that are an immediate risk to Nevada. Establish a protocol to ensure this information is shared with the agency or group that controls the land most likely to be invaded from the surrounding states.
6. Develop and implement prevention techniques such as:
  - Border protection
  - Certification programs for noxious weed-free hay, straw, and seed products
  - Coordination with prevention efforts in adjacent states
  - Wash stations for cleaning equipment
  - Dirt and gravel certification programs
  - Education about the spread of invasive species for recreationists
  - Educational programs for contractors
  - Close monitoring of livestock egress from weed-infested areas
  - Other appropriate best management practices
  - Eradication and control management within watersheds
  - Good neighbor policies between property owners and land managers

## **6. RESEARCH**

Research and technology are tools that allow for more effective identification, mapping, control, and monitoring of weed infestations, and may also provide data to allow critical evaluation of the cost vs. benefits of various weed management options. A large gap in knowledge currently exists among weed control practitioners concerning application of integrated pest management principals. In many cases the solution of choice is herbicidal control, when in fact it may not be the most effective control method. One element of integrated pest management involves the use of biological controls for weed management. Nevada's challenging climate makes it difficult to predict the success of biocontrol agents that have proven effective in other states. These agents must not only have a negative impact on the target weed population, but they must also thrive and become widespread in all habitats and climates that the pest weed occupies.

On the other hand, some weed species are extremely difficult to control by methods other than chemical. While advances continue to be made in the

arena of effective chemical controls, there are specific ecosystems and weed species for which these controls are not yet available. One example is the control of tall whitetop in riparian areas and wetlands. Currently, there is no highly effective herbicide available that can be used in wet areas. Likewise, some weed species such as rush skeletonweed are by nature resistant to all chemical controls.

Finally, little effort has been expended to date on the issue of successful revegetation of areas following weed control. Revegetation is an essential component of the identification/treatment/monitoring/site stabilization process. When treated sites are left bare or disturbed there is a high likelihood that weeds will quickly reinvade these sites.

The Nevada Weed Action Committee proposes the following critical research needs:

1. Develop more sophisticated, accurate remote sensing techniques, including unique signatures of weed species, to allow mapping of large areas using satellite data or other large-scale methods.
2. Document the effectiveness of various plant species in competing with invasive weeds, and in the natural succession of plants and rehabilitation of reclaimed sites. Information is also needed on timing, methods of planting, and long-term monitoring needs for these sites.
3. Provide training on integrated weed management techniques for pesticide applicators and agency personnel. Research on alternative control mechanisms and their effectiveness will support this training effort and provide additional tools for weed control efforts.
4. Support the testing and water labeling of existing effective herbicides for use in riparian areas and wetlands and be responsive to petition for pesticide use under Section 18 and 24c (FIRFA) through NDOA. Support research on new chemicals or methods of application for use in Nevada.
5. Identify and prioritize difficult-to-control species and support research into alternative methods of control, including the development of new chemical products.
6. Develop economic data to determine the relative costs of early control vs. the cost impacts of delayed control. Costs include weed control costs, loss of productivity/sales, lost recreation benefits, the intrinsic value of the resource, etc.
7. Conduct field trials to determine whether existing biocontrol agents in use in other states are of value in controlling weeds in Nevada. For those weeds

for which biocontrols have not yet been identified, support research efforts to identify agents.

8. Collect data on the fate and transport of herbicides to support their appropriate and desirable uses.

### III 5-YEAR ACTION PLAN

WEED MANAGEMENT					
Issue	strategy	Action	responsibility	targeted completion	performance measure
need to show action at local level to reduce weed populations	create local and regional weed districts and CWMAs	prioritize 5 species of concern to manage by area; organize districts & CWMAs	counties, federal agencies, private landowners	5 year	new weed districts, memoranda of agreement, and CWMAs established in all counties by 2006
weed control not being done because of lack of weed management contacts at local level	increase the network of weed management contacts across Nevada	assign weed coordinator duties or designate a point of contact in all federal, state, county and local agencies and offices with land or resource management responsibilities	federal, state local and county agencies	1 year	a directory of weed coordinator/POCs throughout Nevada is published and available to the public and agencies by June 30, 2001 and updated annually (also available on NWAC website)
weed control not being done because of lack of weed management programs and infrastructure at the local level.	develop an appropriate infrastructure at the county level to effectively use available weed control funds	Develop and implement weed management programs in every county	NDOA, counties	5 year	each county has an integrated vegetation/weed management plan in place by 2006 with an annual operating plan for weed control
to successfully complete weed control goals, increasing funding needs to be allocated to weed control	increase awareness of the seriousness of invasive weeds to increase funding opportunities	Prepare statements on the annual economic impact to Nevada and budget estimates for costs of weed control, prevention and education, for the 2003 legislative session	NDOA, UNR, NCE	2 year	Briefing packages for legislators completed by August, 2002

## WEED MANAGEMENT

Issue	strategy	Action	responsibility	targeted completion	performance measure
lack of availability of native seed for post disturbance restoration to prevent weed infestations	Increase availability and lower cost of native seed	expand capabilities of state seedbank; create funding for coordinator or manager who can then contract with seed growers, expand collection activities, develop educational materials and specify techniques to plant native seed crops commercially	NDF, NDOA	3 year	annual support funding from state by 2003
weed control not being done because of lack of equipment availability	Increase weed control by increasing awareness of available equipment	make inquiry for available equipment; create a directory and equipment pool process; create bulk purchasing programs	NDOA	1 year	directory available by 6/2001 (NWAC website); steps/process to use equipment in pool written by 6/2001
no communication for ongoing weed control projects to inform others of areas under treatment, successes, failures	gather information on all ongoing weed control projects and make available	develop process and central location for records on weed control (included on mapping section)	NDOA; NRCS; contribution of data by all agencies, weed mgmt districts; private landowners, etc.	Ongoing	info being transmitted and in place by 1/2001
to successfully complete weed control goals, increased funding needs to be allocated to weed control	Increase awareness of the seriousness of invasive weeds to increase funding opportunities	Prepare economic statements for cost of weed control, prevention and education for 2003 Legislative session	NWAC; UNR	1 year	have analysis completed by 10/2001



## EDUCATION AND AWARENESS

issue	strategy	action	responsibility	targeted completion	performance measure
lack of public awareness or education about invasive weeds	programs need to be developed to teach youth about invasive plant species	develop and implement curriculum and submit to state education board for certification; develop 4-H plans as well	NCE and ISC Nevada State Parks	2 years	plan developed and certified by 6/2001; implemented in schools by 1/2002; 4-H plan written by 6/2001 implemented by 8/2001
agencies/applicators lack training to use integrated control techniques	implement expanded training on IWM and equipment operation within agencies lacking this instruction	BLM currently has training-course may be used for other agencies/applicators; make BLM's IWM course available for public use; increase NDOA's current licensing program to include more IWM	NCE, NDOA, USFS, BLM	1 year	additional IWM programs in place by 3/2001
Limited access to information on current weed programs and information specific to Nevada	create a site on the internet to make weed information available	develop website for NWAC, state weed plan; this site should contain other relevant weed info or links to the other sites	NDOA to house website	1 year	state weed plan currently on NCE website; website for NWAC up by Jan 1, 2001
need for public to have greater awareness/access to invasive weeds information	create position an education based weed specialist for public contact	finalize NCE weed specialist position	NCE	1 year	position hired for by winter (2001-2002)

## EDUCATION AND AWARENESS

issue	strategy	action	responsibility	targeted completion	performance measure
local governments need to place more emphasis on preventative measures; land owners, occupants not aware of weed control responsibility; visitors/tourists, hunters/fishermen, construction companies, unaware of their role in possible transportation and spread of noxious weeds;	raise public understanding of and participation in weed control	create campaign to educate public about NRS statutes regarding responsibility for noxious weed control; posters/brochures to educate about presence of and methods of control for noxious weeds; list of preventative measures for construction companies, local governments	NDOA ; NCE; NDOT, USFWS, NDOW, Division of Mines	1 year	brochures, posters on legal responsibility distributed by 2/2001; increase letters to land owners from NDOA (ongoing); NWAC website to house link to NRS 555; educational material developed and distributed by 6/2001
lack of one source for available speakers to increase awareness and education	combine various existing lists of speaker resources into one list	establish and advertise a speakers bureau; link to or combine with NWAC web site	NCE	1 year	website with names and contact information up by Jan 1, 2001

## COORDINATION, COOPERATION AND PARTNERSHIPS

issue	strategy	action	responsibility	targeted completion	performance measure
planning for control difficult without knowing extent of invasion	continue mapping and surveys of present infestations; map susceptible areas; map current weed control projects	complete state weed map; update map annually; move toward consistent data collection to facilitate map production	NRCS; all agencies collecting data: NDOA	1 year	1st generation state weed map completed and on NDOA website by 1/2001
lack of coordination between agencies and districts founded in lack of communication	increase/create opportunities to share information, progress, priorities	NWAC meeting quarterly (rotating locations) to include rural and southern areas	all agencies	ongoing	ongoing
counties need to take on greater participation in control & prevention	educate and enlist support and cooperation within all counties	NDOA meet with NACO this November to educate all commissioners on legal responsibility	NDOA	current	attend NACO meeting in November, 2000
to insure success of weed plan, all agencies need to commit to participate	gain commitments from each agency involved	write an interagency agreement	NDOA	1 year	have agreement signed by 10/2001
lack of communication among weed control personnel at all levels	Gather and make accessible contact information on all persons involved in weed control	develop and distribute a comprehensive directory of individuals involved in weed control	NDOA	1 year	have directory available by 4/2001 (on NWAC website)
many necessary weed programs never start or fail due to lack of funding	increase awareness of funding opportunities available	link NWAC website to National site for funding options and availability	NDOA	1 year	(NWAC website) link by (check when National site will be ready)

## PREVENTION OF NEW INFESTATIONS

Issue	strategy	Action	responsibility	targeted completion	performance measure
awareness of invasives in surrounding states to prevent their entry into Nevada	stay updated with other states and their invasive species	facilitate annual meeting with adjoining state' s departments of Ag; create list of potential invasive species	NDOA	Ongoing	publish meeting notes for NWAC, NWMA; publish list of potential invasive species (NWAC website)
Hay growers may lack awareness or commitment to suppress weeds and buy into weed free hay programs; also relates to movement of livestock and reclamation activities	support programs requiring weed free hay; educate and enlist support of hay growers	advertise voluntary state weed free hay/straw certification and pending federal moratorium; develop site advertising available weed free hay growers	NDOA, BLM, USFS, any agency participating in weed seed free hay use only requirement	1 year	website listing weed free hay growers and procedure for becoming certified up by 2/2001 (NWAC website) additional inspectors hired/available by 2001 growing season

## RESEARCH

Issue	strategy	Action	responsibility	targeted completion	performance measure
more funding is needed to adequately implement weed control; need information on costs already incurred	implement research to determine direct and indirect economic effects of weeds	work up reports on economic impacts to environment, public health, economy	UNR	ongoing	reports/analysis available by 12/2001 (data collecting/compiling ongoing)
biocontrols not used to full potential possibly due to lack of regional performance testing	continue current implementation of biocontrols and increase testing of possible additional organisms	promote additional funding of biocontrol research at UNR, USDA, NDOA and other agencies capable of undertaking this type of research	all agencies	ongoing	ongoing
restoration needs to be researched more thoroughly to provide successful techniques of post disturbance reclamation to prevent noxious weed invasions	continue/increase research and documentation of competition of rest. species vs. invasives	include increased education regarding restoration techniques in weed control meetings, programs, etc.; promote/support additional programs on restoration at UNR; increase awareness of need to monitor current reclamation projects	all agencies	ongoing	Ongoing
riparian infestations continue to spread unchecked in part due to lack availability of approved herbicides	need to have more approved herbicides for riparian areas	support testing and water labeling of existing herbicides; increase research on new chemicals and methods of application	UNR, USDA, NDOA	Ongoing	Ongoing

## IV. FUNDING

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Adequate funding is an essential component of any weed management plan. The most comprehensive, well-developed action plans will fail to succeed if funds are not allocated for each proposed item. At the current time, every element of this plan is under funded. The speed at which invasive weeds can enter and colonize Nevada's lands far exceeds our ability to respond, both in terms of labor and funds available. Even if grant funds can be successfully obtained there are often match requirements that cannot be fulfilled without funding at a state or local level.

Other states have used a number of ways to fund state weed efforts, from fees on motor vehicle license plates or special edition license plates to county property tax levies, special weed district levies, state level legislative support, fees on herbicides, private donations, and more.

Based upon watershed and weed district management, Nevada Weed Action Committee suggests the following funding mechanisms and needs:

1. Development of memorandum of understanding and work for those public and private parties within the weed management areas to include shared responsibilities, resources (including funding), and rights of trespass to manage identified plant species.
2. Annual development of a weed management plan, including funding and committed resources from county mil levies, agencies' funds and in-kind contributions, and private resources.
3. Obtain local funding and in-kind resources, including volunteers, through range, agricultural, recreational, civic, social religious, service, and volunteer organizations.
4. Provide legislative funding for specific management strategies to protect watersheds as supplemental and/or emergency programs for local resources on a case-by-case or species-by-species basis.
5. Establish a mil-levy on license plates or fuel sales to fund weed species management along highways, roads, and at border check stations. Likewise, secure funds via licensing of recreationists through stamps and licenses.
6. Organize a non-profit foundation to administer state tax generated funds, make investments, and seek additional outside funds for competitive grant funding to weed management districts or areas for specific projects.

7. Out funding (grant) sources shall be identified and applicants will be helped with funding procurement made available via the foundation to secure resources from philanthropists, foundations, and benefactors. Public, corporate, and private sources will also be sought.
8. Adequate, on-going funding for educational and prevention programs.
9. Support for funding to allow critical control research to be completed.

# NEVADA DEPARTMENT OF AGRICULTURE

## NOXIOUS WEEDS LIST

Common Name	Scientific Name
African Rue	Peganum harmala
Austrian fieldcress	Rorippa austriaca
Austrian peaweed	Sphaerophysa salsula / Swainsona salsula
Black henbane	Hyoscyamus niger
Camelthorn	Alhagi camelorum
Common crupina	Crupina vulgaris
Dyer's woad	Isatis tinctoria
Eurasian water-milfoil	Myriophyllum spicatum
Goats rue	Galega officinalis
Klamath weed	Hypericum perforatum
Hemlock: (a) Poison; and (b) Water.	Conium maculatum Cicuta maculata
Horse-nettle: (a) Carolina; and (b) White	Solanum carolinense Solanum elaeagnifolium
Houndstongue	Cynoglossum officinale
Hydrilla	Hydrilla verticillata
Knapweed: (a) Diffuse; (b) Russian; (c) Spotted; and (d) Squarrose	Centaurea diffusa Acroptilon repens Centaurea masculosa Centaurea virgata Lam. Var. squarrose
Leafy spurge	Euphorbia esula
Mayweed chamomile	Anthemis cotula
Mediterranean sage	Salvia aethiopis
Medusahead	Taeniatherum caput-medusae
Perennial pepperweed or tall whitetop	Lepidium latifolium
Puncture vine	Tribulus terrestris
Purple loosestrife	Lythrum salicaria
Rush skeletonweed	Chondrilla juncea
Saltcedar (tamarisk)	Tamarix ramosissima
Sorghum species, perennial, Including, but not limited to: (a) Johnson grass; (b) Sorghum alum; and (c) Perennial sweet sudan	
Sulfur cinquefoil	Potentilla recta
Thistle: (a) Canada; (b) Musk; (c) Scotch; (d) Sow; (e) Iberian star; (f) Purple star; and (g) Yellow star.	Cirsium arvense Carduus nutans Onopordum acanthium Sonchus arvensis Centaurea iberica Centaurea calcitrapa Centaurea solstitialis
Toadflax, Dalmatian	Linaria dalmatica
Toadflax, yellow	Linaria vulgaris
Whitetop or hoary cress	Cardaria draba



## **APPENDIX B**

### **EXISTING AGENCY PROGRAMS**

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#### **• NEVADA DEPARTMENT OF AGRICULTURE**

The Nevada Department of Agriculture has primary responsibility for the implementation of noxious weed laws (NRS Chapter 555.010 through 555.220). The function of the noxious weed program of the Division of Plant Industry is to investigate and take action to control noxious weeds to protect the crops, livestock, public health, wildlife, water quality and beneficial uses of Nevada land. Information on noxious weed laws and regulations, and noxious weed biology and management is provided to all Nevada citizens.

The Department of Agriculture conducts noxious weed programs and biological control agent release programs around the state. Straw and forage may be certified weed free by participating in the Department's voluntary program. The Department also participates in local cooperative noxious weed control efforts through the state's invasive weeds specialist, and is responsible for ensuring abatements for noxious weeds are carried out using procedures in Nevada Law when required.

The Department of Agriculture's Division of Plant Industry is located at:

350 Capitol Hill Avenue  
Reno, Nevada 89502  
Phone: (775) 688-1180  
Fax: (775) 688-1178

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#### **• NEVADA DEPARTMENT OF TRANSPORTATION**

The Nevada Department of Transportation maintains 5,492 centerline miles of streets and highways within Nevada. These streets and highways are divided into rural routes, small urban routes and urban area routes. Weeds, in general, are either sprayed, mowed, or hand weeded. The first ten feet of the rural and small urban routes are sprayed by a commercial applicator on an annual contract. Nevada Department of Transportation maintenance crews will also do weed spraying within landscaped areas along urban routes. Spraying by the Nevada Department Of Transportation crews is also accomplished in areas where safety is a concern. Weed mowing is done outside of the first ten feet in rural settings when roadway visibility affects safety.

Nevada Department of Forestry conservation crews, juvenile crews, and community service crews are utilized to do hand weeding within landscape areas and along urban routes in Reno and Las Vegas. Conservation crews also perform hand weeding on rural roads in tight confined areas. The Nevada Department Of

Transportation maintenance crews will remove weeds when safety and aesthetics dictate.

For the past four years the Nevada Department Of Transportation has contracted with the Nevada Department of Agriculture to spray noxious weeds along roadways. The Nevada Department Of Agriculture utilizes two two-person crews to spot treat noxious weeds in Lincoln, Lander, White Pine, Elko, Eureka, Humboldt, Washoe, Pershing and Carson City Counties. County weed districts in Churchill and Douglas County have sprayed Nevada Department Of Transportation right-of-ways for the last two years by agreement with the Nevada Department Of Agriculture. The Nevada Department Of Transportation reimburses the Nevada Department Of Agriculture for these costs. As part of an overall vegetation management practice, selected areas that have weed abatement control applied will be re-seeded to promote biological diversity and to help retard the re-introduction of noxious weeds.

The state office of the Department of Transportation is located at:

1263 South Stewart  
Carson City, Nevada 89712  
Phone: (775) 888-7050  
Fax: (775) 888-7211

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- **NEVADA DIVISION OF CONSERVATION DISTRICTS**

It is the mission of the Division of Conservation Districts to regulate, train, and assist the state's locally led conservation districts which work to conserve, improve, and sustain the state's renewable natural resources by providing outreach and technical assistance to individual landowners through partnership with other local, state, and federal agencies. The division of Conservation Districts carries out the policies of the State Conservation Commission in supporting the state's 28 conservation districts. The division and district programs focus on the state's renewable natural resources, and work with private landowners to carry out voluntary conservation programs and projects.

The state's conservation districts, each composed of locally elected supervisors, work to conserve, develop, and preserve the state's renewable natural resources. The districts identify areas of concern, and coordinate with other public and private agencies to provide services to individual landowners so their concerns may be addressed. The districts receive technical assistance from the United States Natural Resources and Conservation Service, an agency of the United States Department of Agriculture. In addition to Natural Resources Conservation Service, the division is directed to cooperate and collaborate with other federal agencies as necessary to assist districts in carrying out their programs.

The Division of Conservation Districts' main office is located at:

333 West Nye Lane, Room 118  
Carson City, Nevada 89706-0857  
Phone: (775) 687-6977  
Fax: (775) 687-3783

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## **NEVADA DIVISION OF FORESTRY**

The Division of Forestry administers, coordinates, and manages all forestry, nursery, endangered plant species, and watershed resource activities on certain public and private lands. The Division provides for fire protection of structural and natural resources through fire suppression and prevention programs and provides other emergency services as required. The division, through the utilization of long range planning objectives, enhances its management of forest resources, watersheds, and rangelands on certain public and private lands. The harvesting of timber, Christmas trees, Cacti, and Yucca are monitored to ensure compliance with state laws and the Forest Practices Act. Permits are issued for the thinning of overstocked timber and the reduction of the threat of wildfire. Technical assistance is provided to landowners to help them develop plans for how to best manage their natural resources. Protection of endangered plant species is conducted in coordination with numerous federal, state and local entities. The Nursery and Seedbank Program is responsible for providing conservation plant materials and technical expertise for conservation plantings, the rehabilitation of wildfire and other natural caused damaged lands, and the control of invasive species.

The Division's Regional and State Offices can provide technical assistance regarding weed management and through ten statewide Conservation Camps, provide labor and equipment to complete a variety of weed control and treatment projects. Conservation plant materials, native and adapted seed, and seeding equipment is available through the Division's Nursery and Seedbank Program for rehabilitating lands treated to control noxious weeds and invasive species. A comprehensive approach to the control of invasive species can be provided by the Division of forestry on a statewide basis.

The Nevada Division of Forestry State Office is located at:

1201 Johnson Street, Suite D  
Carson City, Nevada 89706  
Phone: 775-684-2500  
Fax: 775-687-4244

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- **NEVADA WEED DISTRICTS**

The Nevada Legislature declares that it is primarily the responsibility of each owner or occupier of land in the state to control weeds on his or her land, but recognizes that in certain areas this responsibility can best be discharged through control by organized districts. Weed districts are formed to manage (control) noxious weeds that have the potential to spread widely and cause damage to the community, its economy, and the environment.

A district can be formed by petition of property owners to county commissioners or by resolution of county commissioners. Nevada Revised Statutes 555 and 318 provide the legal procedures to be followed in establishing a district or allowing a district to expand its duties to include weed control activities. A district can be funded by general tax revenues of the county, levying of a tax or payment for weed control services performed by a district.

A board of directors (trustees) provides general oversight direction for the district. The board hires a supervisor to manage the day-to-day operations of the district and make recommendations to the board.

A district can adopt the list of noxious weeds in NRS 555.010, or prepare a list of weeds to be controlled in the district. The district has the authority to perform weed management activities on public and private lands if the landowner or occupier fails to take appropriate action.

As of November 1999, there were only seven (7) areas of Nevada covered by weed districts. These include the unincorporated areas in Paradise Valley, Diamond Valley, Lovelock, Goose Creek, Walker River, Lamoille, and Douglas County.

Under newly enacted legislation the Churchill County Mosquito District has also begun to function as a weed district. All functioning districts are scattered in the northern portion of the state, leaving the center and southern portions without an organized effort.

Another practice becoming widely used is the "Memorandum of Understanding". These agreements usually cover large areas of adjacent land and are managed by, or for, multiple owners. When agreed to by public and private entities, the Memorandum of Understanding defines objectives and coordinates efforts in controlling noxious weeds.

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## **USDA AGRICULTURAL RESEARCH SERVICE**

The exotic and Invasive Weed Research Unit is a linkage of Albany, California, Davis, California, and Reno, Nevada research stations. The unit's mission is to develop and implement biologically-based weed control. The Albany station searches for potential biocontrol agents in the target weed's native range, conducts specificity trials on potential agent in its quarantine facilities, and when appropriate, conducts field trials to deduce effectiveness of potential biocontrol agents.

The Davis unit specializes in basic ecological research and control strategies pertaining to aquatic and semi-aquatic weeds.

The Reno unit specializes in weed ecology, plant-soil relationships of weeds, herbicidal control of weeds, and revegetation and restoration strategies.

In Reno contact:                      Bob Blank, Location Coordinator  
775-784-6057  
[blank@scs.unr.edu](mailto:blank@scs.unr.edu)

At Davis contact:                      Lars Anderson or Dave Spencer  
530-752-1096 or 530-752-6260  
[iwanderson@ucdavis.edu](mailto:iwanderson@ucdavis.edu)  
[dfspencer@ucdavis.edu](mailto:dfspencer@ucdavis.edu)

The Agricultural Research Service's office is located at:

920 Valley Road  
Reno, Nevada 89512  
Phone: (775) 784-6057  
Fax: (775) 784-1712

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## **USDA FARM SERVICE AGENCY**

The Nevada Farm Service Agency (FSA) is an agency of the U.S. Department of Agriculture. The primary goals of the agency are to encourage conservation measures and stabilize farm economy. FSA has seven county offices located across the state to serve all of Nevada's farmers and ranchers.

FSA offers many programs and services for producers. However, FSA and NRCS work together in a few of these program areas, including the Environmental Quality Incentives Program (EQIP). One of the conservation practices that can be requested by the producer for incentive cost sharing under EQIP is Pest

Management. By definition, this practice can be used to manage weeds to reduce adverse effects on plant growth, crop production and environmental resources. It includes appropriate cultural, biological and chemical controls.

Nevada is divided into priority areas with locally led work groups that include local producers to offer advice regarding the implementation of all EQIP practices, including Pest Management. Therefore, areas of the state differ in the amount of incentive cost share provided for these practices.

The Nevada FSA State Office is located at:

1755 E. Plumb Lane, Suite 202  
Reno, Nevada 89502-3207  
Phone: 775-784-5411  
Fax: 775-784-5015

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- **USDA FOREST SERVICE**

Invasive plants and noxious weeds pose an ever-increasing threat to native forest ecosystems, either through direct displacement of native flora or the associated loss of food and cover requirements with which native species have evolved. As articulated in the National Resource agenda, the Forest Service's natural resource priorities are maintaining and restoring watershed health, and sustaining forest and rangeland ecosystems.

Current noxious weed infestations account for less than 1% of national forest lands in Nevada. Although the forest is still in the early stages of inventory, data queries of ecological studies completed on the forest have shown very few noxious weed populations. The Forest Service plans involve continued work with the state, county, conservation districts, and other federal agencies in cooperative weed management activities.

Within Nevada there are three National Forests, including the Inyo National Forest, the Tahoe Basin Management Unit, and the Humboldt-Toiyabe National Forest. The Inyo National Forest is currently developing a Noxious Weed Environmental Assessment. The forest is actively involved with a weed management committee for that area of Nevada and California. The forest has applied for and received a grant from the National Wildlife Foundation's Pulling Together program. These funds have been used primarily for inventory work. Actual control work has been limited to hand pulling until the environmental assessment is completed.

At the present time the Tahoe Basin Management Unit is just starting to address the issue of noxious weeds. They have not yet started the National Environmental Policy Act (NEPA) process for a comprehensive program for weed control. The

efforts that have been undertaken have been on a site-by-site basis, and have generally been limited to hand pulling.

The Humboldt-Toiyabe National Forest has been charged with the management of approximately 6,315,248 acres of land in Nevada and California. With the current low numbers of infested acres on the Humboldt-Toiyabe National Forest, an active control, early detection and prevention program will help ensure the forest stays as weed free as possible. This forest is utilizing an integrated pest management control model that deals with education, prevention, control strategies, mapping, and monitoring. The forest has an active weed management plan that will emphasize best management practices for prevention of spreading weeds, educating the public and employees, and continuing the statewide mapping efforts that are currently taking place.

The Humboldt-Toiyabe National Forests Administrative Business office is located at:

1200 Franklin Way  
Sparks, Nevada  
Phone: (775) 331-6444  
Fax: (775) 355-5399

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- **USDA NATURAL RESOURCES CONSERVATION SERVICE**

The Natural Resources Conservation Service (NRCS) is an agency of the U.S. Department of Agriculture. Natural Resources Conservation Service does not manage land, but rather provides technical and financial support for conservation activities on private, state, local and tribal lands, and federal lands when requested. Assistance is made available through a partnership with local conservation districts. Through its assistance programs, the Natural Resources Conservation Service can influence conservation and wise use of private and public lands, thus benefiting the landscape for future generations.

The Natural Resources Conservation Service's ability to work with multiple interest groups allows for greater flexibility to implement weed control measures within a large watershed or a landowner's horse paddock. Through the voluntary application of conservation plans with private land cooperators, weed control measures and practices can be tailored to the needs and capabilities of the person or persons for whom the plan is written. Utilization of cost-sharable funds from various U.S. Department of Agriculture programs, where applicable, can be helpful both economically and technically to enhance opportunities for weed control implementation. Using the combined knowledge of local cooperators and agency staff, more accurate inventories and assessments of weed infestations and cyclic conditions can be obtained.

Natural Resources Conservation Service's state office is located at:

5301 Longley Lane, Building F, Suite 220  
Reno, Nevada 89511  
Phone: (775) 784-5863  
Fax: (775) 784-5989

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- **USDI BUREAU OF LAND MANAGEMENT**

The United States Department of Interior's Bureau of Land Management (BLM) administers approximately 46.5 million acres of public lands in Nevada. The Bureau of Land Management has an overarching action plan called Partners Against Weeds (PAW) which outlines the steps needed to position the agency for effective weed prevention and control through a series of policy, administrative, and implementing actions.

Under the auspices of the action plan, Bureau of Land Management-Nevada is actively engaged in weed management activities throughout the state, and has an operating budget of \$250,000 as of 1999-2000. Bureau of Land Management-Nevada is the second state to develop and implement a statewide strategy for weed management. The strategy, approved by the Nevada State Director in 1997, is a four-pronged approach that addresses prevention, detection, treatment, and rehabilitation. The strategy is implemented through a three-year operations plan developed annually and tied to the current year budget, to track progress and accomplishments.

All six Bureau of Land Management-Nevada field offices and two field stations have noxious weed coordinators. Additionally, two Bureau of Land Management-California field offices that administer Nevada public lands in Washoe County have noxious weed coordinators. Currently, Bureau of Land Management-Nevada is conducting a systematic inventory of the public lands for noxious and invasive weeds, assisting in developing a multi-agency statewide GIS database, and continuing to develop cooperative partnerships with counties, conservation, and weed districts, as well as other state and federal agencies.

Bureau of Land Management-Nevada is also engaged in many active control programs of identified infestations, and taking aggressive actions to eradicate salt cedar from tributaries to the Colorado River and other watersheds. The Bureau of Land Management-Nevada is a member of the Nevada Weed Management Association, participates in the Noxious Weed Action Committee, and serves on the Nevada Invasive Species Council.

The Nevada State Office of Bureau of Land Management-Nevada is located at:

1340 Financial Boulevard  
Reno, Nevada 89502  
Phone: (775) 861-6400  
Fax: (775) 861-6712



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- **USDI BUREAU OF RECLAMATION**

The Bureau of Reclamation Lahontan Basin Area Office manages approximately 400,000 acres in northern Nevada. The Lahontan Basin Area Office does not have any formal noxious weed management plan, and does not implement activities to reduce noxious weeds on lands within our jurisdiction. The exception is required noxious weed mitigation identified in environmental analyses of federal activities under the National Environmental Policy Act. These activities usually encompass small, localized project sites.

The Lahontan Basin Area Office has two irrigation district contractors, Truckee Carson Irrigation District and Pershing County Water Conservation District. Both irrigation districts have weed management plans, including targeting of noxious weeds.

Truckee Carson Irrigation District's weed department is responsible for irrigation boundaries within the Newlands Project (primarily along the Truckee Canal, and the canals and drains in the Fernley and Fallon agricultural areas). Truckee Carson Irrigation District utilizes both herbicides and mechanical methods to halt or slow the spread of noxious weeds within their area of responsibility. Their weed department has two permanent employees and two temporary employees. Noxious weeds are detected by these employees while working in the field and through calls from landowners and the Churchill County Mosquito and Weed Abatement District.

Pershing County Water Conservation District works closely with the Lovelock Valley Weed Control District on their weed control programs. Pershing County Water Conservation District is responsible for 40,700 acres within their irrigation district boundaries. Herbicide control applications are made primarily along the canals and drain banks, and in some pasture land. In addition, Pershing County Water Conservation District implements noxious weed control within the 29,900 acre Battle Mountain Community Pasture. The Community Pasture is part of Reclamation's Lahontan Basin Area Office's 400,000 acres of managed lands. The two primary noxious weeds that Pershing County Water Conservation District treats include saltcedar and tall whitetop. Pershing County Water Conservation District reports very good control success with their herbicide applications, but notes the problem will persist in their areas as long as the weeds aren't controlled upstream.

The Bureau of Reclamation's Lahontan Basin Projects office is located at:

705 North Plaza  
Carson City, Nevada  
Phone: (775) 882-3436  
Fax: (775) 882-7592

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- **USDI FISH & WILDLIFE SERVICE**

The United States Department of the Interior Fish and Wildlife Service (Service) has recently been directed by their Washington office to become more involved in the war on invasive species. Currently, the Service manages upwards of 90 million acres on 500 refuges nationwide. Noxious weeds, whether plant or animal species, are a concern on many of our refuges; however, a comprehensive inventory of the extent of the problem has not been conducted. The Service's weed program is in its infancy, but they are continuing to develop priorities and projects with the cooperation of many entities.

One program currently in place is the collaborative effort to control purple loosestrife (*Lythrum salicaria*) along the Truckee River and its tributaries. Subsequent to the 1997 flood, the Service received funding to address flood-related issues. The Service teamed with the Nevada Department of Agriculture, Pyramid Lake Paiute Tribe, USDA Agricultural Research Service, and UNR Cooperative Extension to implement actions to eradicate purple loosestrife. A cooperative agreement was executed between the Service and the Nevada Dept of Agriculture in which the Service provides funding annually for the Nevada Dept of Agriculture to coordinate efforts and conduct spraying. Meetings are held periodically to discuss the status of the project and future needs.

The Service intends to draft and implement a weed management plan for the Ash Meadows National Wildlife Refuge; however, efforts are currently taking place to control saltcedar (*Tamarix* spp.) on these lands. The Service hopes to advance the weed program by seeking future partnerships and provide funding to combat noxious weeds not only on refuge lands but also on other private and public lands.

The USDA Fish and Wildlife Service office is located at:

1340 Financial Boulevard  
Reno, Nevada 89502  
Phone: (775) 861-6300  
Fax: (775) 861-6301

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- **USDOD NAVAL AIR STATION**

The Navy manages over 200,000 acres in Churchill County. This land has been designated to support the needs of the military training and testing mission. Natural resource managers responsible for this land balance the goal of providing realistic training while maintaining environmental stewardship. They understand the military mission, the sensitivities of the ecosystem, and manage both so that impacts are minimized and/or mitigated. Included in this multiple use

management are challenges faced by all public land managers; rare species conservation, wetlands protection, cultural resources protection, habitat conservation, agricultural out leasing, exotic species management, biodiversity preservation, and others.

NAS Fallon has an Integrated Pest Management Plan and weed control is an important part of it. Mechanical, biological, and cultural techniques are the primary methods of weed control and pesticides are used as a secondary control. Currently, NAS Fallon is mapping the locations of invasive weeds on Navy lands with the GIS. The station will continue to work with the state, county, conservation districts, and the Department of Interior in cooperative weed management activities.

Naval Air Station Fallon  
Natural Resources Management Branch  
4755 Pasture Road Code N45F  
Fallon, Nevada 89496-5000  
Phone 775-426-2956  
Fax 775-426-2771

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## • **UNIVERSITY OF NEVADA COOPERATIVE EXTENSION**

The University of Nevada Cooperative Extension is a federal/state/county partnership dedicated to bridging the gap between research on the University campuses, and the needs of the community. Cooperative Extension does not manage land, but instead provides residents statewide with information and skills they can use to make informed decisions that will improve their lives. Extension's invasive weed programs have focused on providing most up-to-date information on weed biology, spread, management, and control in a format that is easily accessed by local citizens. Extension partners with other state and county organizations to disseminate these materials and showcase demonstration areas.

Extension weed programs include intensive trainings for Weed Warriors, information on the development of weed management plans, volunteer community control efforts, research and demonstration sites, and development of educational materials. Cooperative Extension is also active in statewide weed mapping and collaborative control programs.

University of Nevada Cooperative Extension's main office is located at:

University of Nevada Cooperative Extension  
Judicial College, Room 118  
Mail Stop 404  
Reno, Nevada 89557-0106  
Phone: (775) 784-7070  
Fax: (775) 784- 7079